

NEMATODES FROM AUSTRALIAN ALBATROSSES AND PETRELS

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The collection which is now being reported on has been assembled during the past thirty-three years, mainly from birds washed ashore after gales. Many of the hosts were sent from the South Australian Museum by the late Director, E. R. Waite, and the present Director, H. M. Hale, to the senior author for examination, the birds having been obtained by Messrs. E. R. Waite, J. Sutton, H. Condon or B. C. Cotton. Mr. Condon has been assiduous in patrolling the local beaches, especially Sellicks Beach, after storms in order to obtain sea birds for the Museum collection and is responsible for many of the host identifications. Prof. Cleland supplied material from Encounter Bay. The Director of the Australian Museum, Sydney, sent some parasites from New South Wales for identification. We desire to thank those who have assisted us, and to acknowledge indebtedness to the Commonwealth Research Grant to the University of Adelaide.

The types of the new species now described, with the exception of *Contracecum pelagicum*, have been deposited in the South Australian Museum, Adelaide. The types and other material of *C. pelagicum* are in the Australian Museum, Sydney.

The only nematodes previously recorded from Australian petrels were: (1) *Seurattia shipleyi* from the Cape pigeon, *Daption capense*, from New South Wales (Johnston 1912), and (2) *S. marina*, described by us (1941) from *Pelagodroma marina*, collected by Prof. Cleland on Flinders Island, Bass Strait. Johnston (1937) recorded *Anisakis diomedea* as having been taken from *Diomedea exulans* off south-western Tasmania (44° 30' S., 141° E.). Stossich (in Shipley 1900) identified *Gnathostoma shipleyi* (= *Seurattia shipleyi*) from *D. exulans* taken off New Britain by Willey.

The following is a list of parasites identified, recorded under their hosts:

- DIOMEDEA EXULANS Linn.—Port Jackson, N.S.W.: *Paryseria diomedea* n. sp., *Anisakis* sp. (immature), *Seurattia shipleyi* (Stoss.). Tasmanian Seas: *Anisakis diomedea* (Linst.).
- DIOMEDEA CHIRYSOSTOMA Forst.—Sellicks Beach, S. Aust.: *Paryseria diomedea* n. sp., *Paryseria macronectes* n. sp., *Anisakis diomedea* (Linst.), *Anisakis* sp.
- DIOMEDEA MELANOPHIRIS Temm.—Brighton, S. Aust.: *Anisakis* sp. (immature), *Seurattia shipleyi* (Stoss.). Sellicks Beach, S. Aust.: *Paryseria diomedea* n. sp., *Anisakis diomedea* (Linst.). Broken Bay, N.S.W.: *Anisakis diomedea*, *Contracecum pelagicum* n. sp.
- DIOMEDEA CHLORORHYNCHA Gmel.—Sellicks Beach, S. Aust.: *Anisakis diomedea* (Linst.). Port Adelaide, S. Aust.: *Tetrameres diomedea* n. sp., *Seurattia shipleyi* (Stoss.). Broken Bay, N.S.W.: *Contracecum pelagicum* n. sp.
- DIOMEDEA CAUTA Gould—Brighton, S. Aust.: *Anisakis diomedea* (Linst.), *Contracecum magnicollare* Jnstr. and Mawson.
- MACRONECTES GIGANTEUS Gmel.—Brighton, S. Aust.: *Anisakis diomedea* (Linst.), *Anisakis* sp., *Paryseria macronectes* n. sp., *Seurattia shipleyi* (Stoss.). Port Adelaide, S. Aust.: *Anisakis diomedea*, *Anisakis* sp., *Phocascaris* sp., *Paryseria macronectes* n. sp., *Seurattia shipleyi*. Sellicks Beach, S. Aust.: *Seurattia shipleyi*, *Phocascaris* sp., *Anisakis diomedea*, *Anisakis* sp.
- DAPTION CAPENSE Linn.—Encounter Bay, S. Aust.: *Anisakis diomedea*, *Anisakis* sp., *Seurattia shipleyi*.

PACHYPTILA VITTATA Gmel.—Sellicks Beach, S. Aust.: *Seuratia shipleyi*, *Paryseria pachyptilae* n. sp.

PTERODROMA LESSONI Garnot—Encounter Bay, S. Aust.: *Anisakis* sp.

PELAGODROMA MARINA Lath.—Reevesby Island, S. Aust.: *Seuratia marina*.

ANISAKIS DIOMEDEAE (Linst.) Yorke and Maplestone

Immature females from *Diomedea chrysostoma* and *D. melanophris* (Sellicks Beach, S. Aust.); *D. cauta* (Brighton, S. Aust.); *D. exulans* (Tasmanian Seas); *Macronectes giganteus* (Brighton, Sellicks Beach, Encounter Bay and Port Adelaide); and from *Daption capense* (Encounter Bay). The species is characterised by the prominent toothed bilobed anterior projections on the lips, the large labial papillae, the prominent cervical papillae lying behind the nerve ring, the short conical tail, and also by the relative lengths of the oesophagus, ventriculus and body. A more detailed account will appear in the report on the parasitic nematodes collected by the British, Australian and New Zealand Antarctic Research Expedition.

ANISAKIS sp. (immature)

From *Diomedea exulans* (New South Wales coast); *D. melanophris* (Brighton, South Australia); *D. chrysostoma* (Sellicks Beach); *D. cauta* (Brighton); *Macronectes giganteus* (Brighton, Sellicks Beach, Port Adelaide); *Daption capense* (Encounter Bay); and *Pterodroma lessoni* (Encounter Bay).

Larvae 15-20 mm. long, .4 mm. wide; with three low lips, well developed larval tooth; oesophagus 2.7 mm. long, including ventriculus .48 mm. long, oesophagus one-sixth body length; nerve ring at .25 mm., and cervical papillae at .42 mm. from anterior end of body. Tail .1 mm. long, rounded, with small pointed tip.

Some of these larvae were exsheathing; others which were rather narrower, were still coiled; while others appeared to be older since the form of the lips was more definite. In some cases the three stages occurred in the same host, and in company with them were more mature worms identifiable as *A. diomedae*. If all these larvae belong to the latter species, then it appears that the parasites enter the bird as fine coiled worms and that their main subsequent growth is in thickness.

CONTRACAECUM MAGNICOLLARE Johnston and Mawson

A male and two females whose general appearance and measurements agree with those of *C. magnicollare* (originally described in 1941 from the noddy, *Anous stolidus*, from the Great Barrier Reef) were taken from *Diomedea cauta* from Brighton, South Australia.

Contracaecum pelagicum n. sp.

Fig. 1-3

From *Diomedea melanophris* (type host) and *D. chlororhyncha*, both from Broken Bay, New South Wales (coll. Australian Museum, Sydney). Those from *D. chlororhyncha* are smaller than those from the type host.

Male 30-33 mm., females 35-38 mm. Head narrower than succeeding part of body; distinct annulate collar. Each lip with marked rounded antero-lateral projections, each projection bearing a distinct tooth. Interlabia bifid at tips in all specimens, the bifurcation being as long as one-third the length of the interlabia in some cases, and the amount of bifurcation not necessarily the same on all three interlabia of one specimen; interlabia generally short, conical, sometimes tapering markedly towards tip. Oesophagus 1:10 to 1:13 of body length; oesophageal appendix 1:3.3 and intestinal caecum 1:1.5 of oesophageal length.

Male—Spicules 1:6.5 of body length. Tail .18 mm. long, ending in point. Six pairs postanal and numerous pairs preanal papillae, latter arranged in longitudinal row on each side.

Female—Tail conical, .32 mm. long. Vulva at about one-third body length from head. Eggs 40-50 μ by 70-80 μ .

The species is distinguished from others of the genus by the presence of two teeth on each lip. The shape of the tail and the number of caudal papillae in the male differentiate it from *C. Scotti* (Leiper and Atkinson) from *Diomedea melanophris*.

PHOCASCARIS sp. larvae

Fig. 4

Several immature females were taken from *Macronectes giganteus* (Sellicks Beach and Port Adelaide). Length 5 mm.; head 70 μ diameter; three lips, with non-denticulate ridges; interlabia absent. Oesophagus .95 mm. long, appendix .5 mm., intestinal caecum .7 mm. Nerve ring .25 mm. from head end. Tail conical, pointed, .14 mm. long.

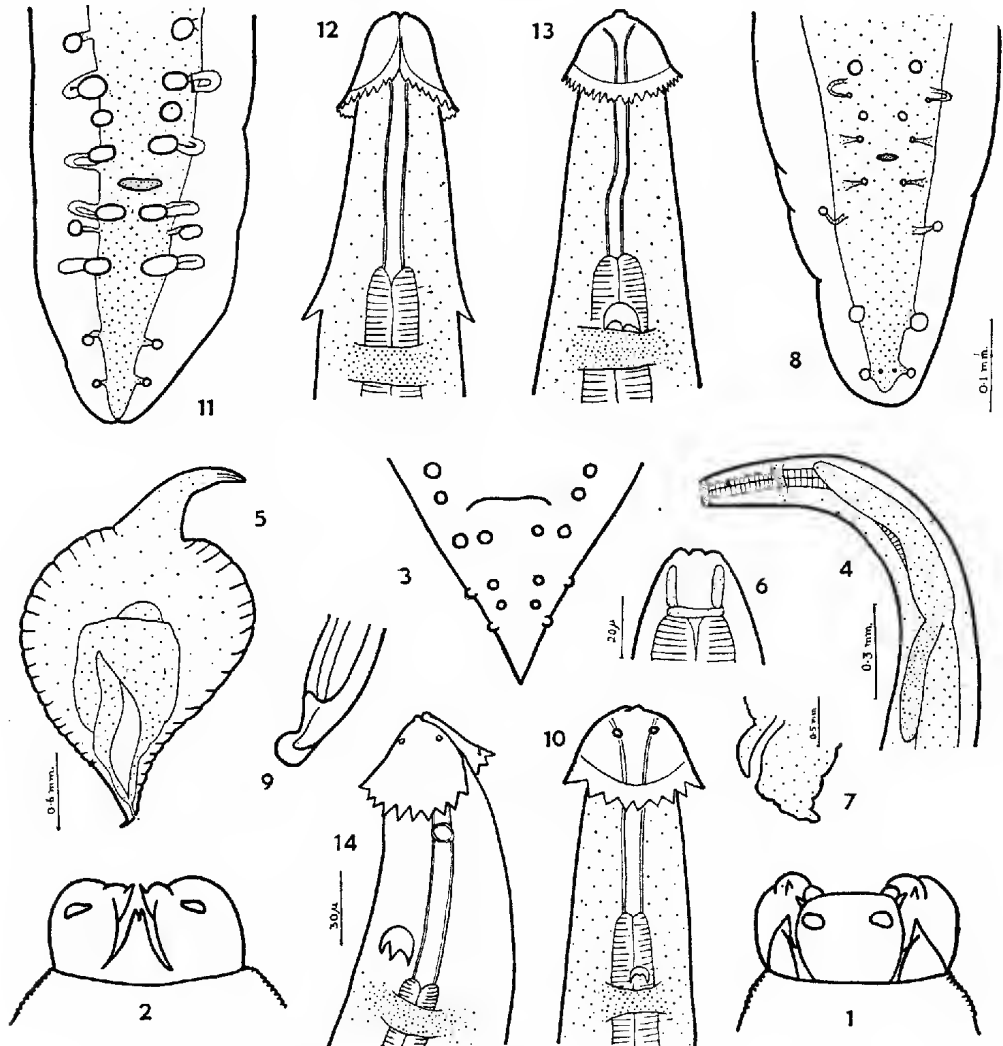


Fig. 1-3, *Contracaecum pelagicum*: 1, dorsal; 2, lateral view of head; 3, male tail, ventral. Fig. 4, *Phocascaris* sp., anterior end. Fig. 5-7, *Tetrameres diomedae*: 5, entire worm; 6, head; 7, female tail. Fig. 8-9, *Scurattia shipleyi*: 8, male tail; 9, tip of shorter spicule. Fig. 10-11, *Paryseria diomedae*: 10, anterior end; 11, male tail. Fig. 12-13, *Paryseria macronektes*, lateral and ventral views of anterior end. Fig. 14, *Paryseria pachyptilae*, anterior end. Fig. 1, 2, 3, and 8 to same scale; 6, 9, and 14; 10, 11, 12, and 13.

Tetrameres diomedae n. sp.

Fig. 5-7

One female from proventriculus of *Diomedea chlororhyncha* (Port Adelaide). Length 3.2 mm., maximum breadth (under cover-slip) 1.8 mm., is in front of mid-length. Anterior end tapering; head truncated with six small lips; buccal capsule well chitinized, 20 μ external diameter, 12 μ internal diameter, 15 μ long. Nerve ring .12 mm. from anterior end. Vulva .15 mm. and anus .8 mm. in front of tip of tail. Internal structure obscured, even after clearing in creosote.

The only species of *Tetrameres* known from an albatross is *T. certa* (Leidy 1886, syn. *Filaria dubia* Leidy 1856, nec Creplin 1846) from *Diomedea exulans* from the South Atlantic. Leidy's account is inadequate and, since our form is much smaller, it is advisable to regard *T. diomedae* as distinct.

SEURATIA SHIPLEYI (Stossich)

Fig. 8-9

From *Diomedea exulans* (New South Wales), *D. chlororhyncha* (Port Adelaide), *D. melanophris* (Brighton, South Australia), *Daption capense* (Encounter Bay), *Macronectes giganteus* (Brighton, Port Adelaide, Sellicks Beach) and *Pachyptila vittata* (Sellicks Beach).

Our specimens agree generally with the descriptions given by Stossich (in Shipley 1900) and by Seurat (1916). In those points in which these two investigators differed, e.g., size of cervical papillae, proportions of the vestibule, and form of the collar (differences which are evident in the figures given by these authors), our material agrees with Seurat's account. Seurat examined only females, while Stossich had both sexes. A lateral view of the male tail in our material agrees with that figured by Stossich, but in ventral view (which was not illustrated by him) definite alae can be seen and there is an extra pair of papillae near the tip of the tail. The terminal multicuspidate papilla does not show up distinctly in ventral view, but, when seen in lateral view, it resembles that figured by Stossich.

The spicules differ in shape and are very unequal, one being .9 mm. long, cylindrical and tapering; the other .23 mm. long, stout, trough-like, with incurving alae on the distal half and with the sides of the trough uniting near its tip to form a prow-like structure, and with the extreme tip bearing a ball-like thickening, just as figured by Stossich who did not indicate the length of the spicules. Eggs are 30 μ by 15 μ .

SEURATIA MARINA Johnston and Mawson

This species was described by us recently (1941) from *Pelagodroma marina* from Flinders Island, Bass Strait. We now record it from the same host species from Reevesby Island, Spencer Gulf, South Australia.

Paryseria diomedae n. sp.

Fig. 10-11

Females from *Diomedea exulans* (type host) from Port Jackson, New South Wales; a complete male from *D. melanophris* and a damaged male from *D. chrysostoma*, both from Sellicks Beach, South Australia.

Female—11-12 mm. long; anterior end rounded, with two pointed lips, each with two papillae. Denticulate collar of two lateral lobes each with about nine or ten spines. Mouth leading to vestibule .14 mm. long, 10 μ diameter. Anterior part of oesophagus .1 mm. long, constricted where nerve ring surrounds it .2 mm. from head; posterior part 3 mm. long. Cervical papillae tridentate, with middle tooth of each shorter than the other two. Tail .16 mm. long, tapering to rounded tip. Vulva 7 mm. from head. Eggs thick-shelled, 40-43 μ by 20-21 μ .

Male (from *D. melanophris*)—7·7 mm. long. Anterior end agreeing generally with that of female. Vestibule ·11 mm. long; anterior part of oesophagus ·8 mm. long, termination of posterior part not seen. Spicules 1·2 mm. and ·09 mm. long. Tail ·17 mm. long with wide caudal alae ·35 mm. long. Four pairs preloacal and five pairs postloacal pedunculate papillae; counting from the most anterior of these, the second, fourth, fifth and seventh have very long peduncles which are twisted in such a way that, in ventral view, the tip appears above its origin from the hypodermis.

The species differs from the genotype, *P. adeliae* Johnston 1937, in the shape and position of the cervical papillae, the number of spines on the collar, and the size of the body.

***Paryseria macronectes* n. sp.**

Fig. 12-13

From *Macronectes giganteus* (type host) from Brighton, South Australia, and *Diomedea chrysostoma* from Sellicks Beach, South Australia. Females only present; 12-15·5 mm. long. Collar with about 18-20 serrations. Cervical papillae ·23 mm. from anterior end, tridentate with the three cusps of approximately equal length. Nerve ring ·25 mm. from anterior end. Vestibule ·17-·18 mm. long, 10 μ wide; anterior part of oesophagus ·62-·7 mm. long, posterior part about 2 mm. Vulva 7·9-8·1 mm. from head. Tail ·2 mm. long, blunt-tipped. Eggs 40 μ by 20 μ .

The species differs from *P. diomedea* in the length of the vestibule and in the number of serrations on the collar.

***Paryseria pachyptilae* n. sp.**

Fig. 14

One immature female was taken from *Pachyptila vittata* from Sellicks Beach, South Australia. The number of spines in the collar, and the position of the cervical papillae in relation to the posterior end of the vestibule, do not agree with any of the three known species of the genus, so, in spite of the inadequacy of the description we have erected a new species:

Length 10·5 mm. Lips each with an anterior projection and two papillae. Collar with about 13 to 15 large serrations on each side. Cervical papillae 90 μ from anterior end, each with three equal teeth. Vestibule ·11 mm. long, with an S-shaped bend about its mid-length (this is not regarded as likely to be typical of the species). Oesophagus 1 mm. long, not obviously divided into two parts, but widening distinctly posteriorly. Nerve ring surrounding anterior end of oesophagus. Tail rounded, 90 μ long. Reproductive organs immature and vulva not seen.

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